North Carolina Orthoimagery Standards Document

1 Issue Categories Overview

The purpose of this document is to discuss the different types of reported issues in the context of the type of issue anomaly category that defines it. This document will provide a summary of the major types of anomalies and provide examples of each. Anomalies are areas within an image where distortion has taken place. Most anomalies happen because the images are being scaled, stretched, rotated and warped as the software accounts for the removal of the tilt of the camera and the relief displacement of the terrain. Almost all rectified images will have some grade of anomalies. The severity of the anomalies depends on how much an image has to be scaled, rotated, and warped. Some anomalies are very easy to identify, while others can be scrutinized as to their validity or their relevance. Correcting these anomalies can be as simple as adjusting the seamlines and as time consuming as using Adobe Photoshop to correct the distorted area. For this reason, anomalies are placed into one of three primary categories:

2 Seamline Anomalies

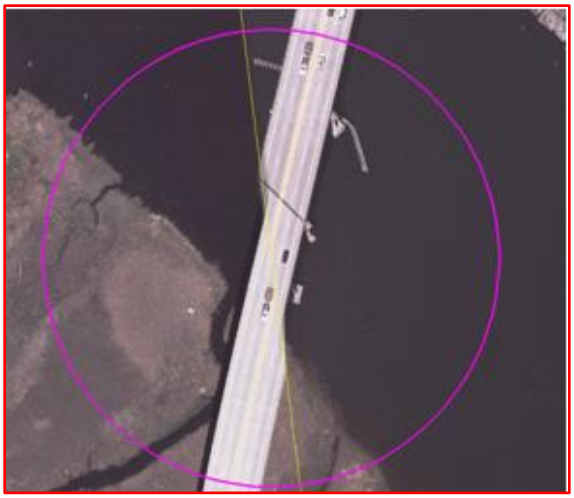
Seamline Anomalies are found in areas where a seamline has been placed. A seamline represents the boundary between two coinciding images that were brought together to create the final orthophoto. Most of the time, an anomaly occurs because the seamline is crossing an elevated feature whose perspective change due to the angle of the camera. These anomalies can be fixed by moving the seamline.

2.1 Seamline cutting:

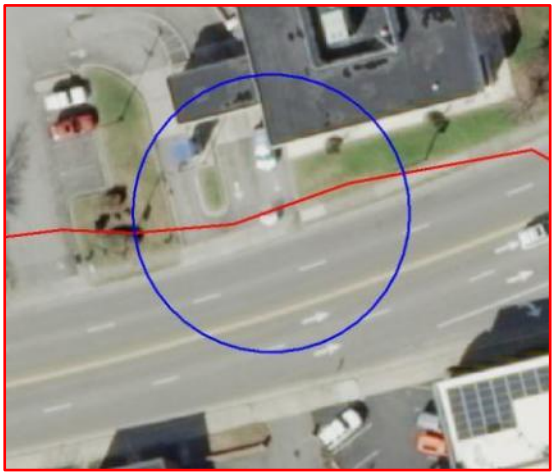
2.1.1 Buildings

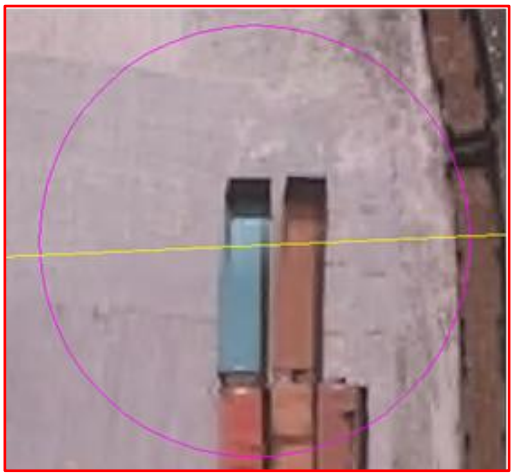
Seamline Anomalies (continued)

2.1.2 Bridges



2.1.3 Automobiles



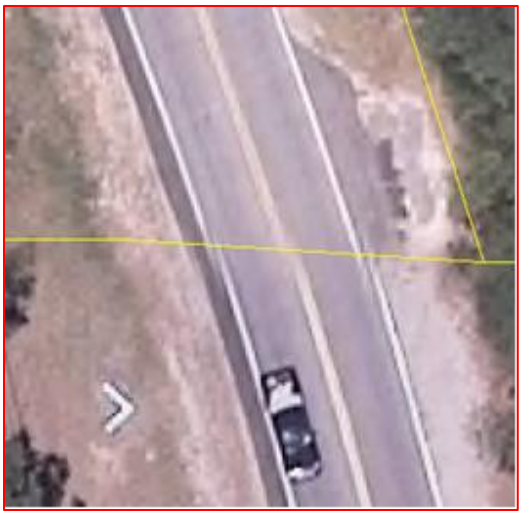


2.1.4 Other Features

Seamline Anomalies (continued)

2.2 Image Ghosting

2.3 Misaligned roads



2.4 Misaligned railroad tracks

2.5 Misaligned elevated features

2.6 Blurriness

3 Elevation Anomalies

Elevation Anomalies are found in areas where the elevation data has either changed or contained error to begin with. However, bridges are an example of where elevation data may be valid, but may still cause elevation anomalies. This is common where the elevated bridge is simply occupying the surface. Most elevation anomalies are easily observed because a feature in the images is distorted. Another example of this type of anomaly occurs near hydro bodies where stray elevation data "pulls" pixels. Many times, elevation anomalies are resolved by adjusting the elevation data.

3.1 Twisted or sunken bridges

3.2 Twisted or warped roads

Elevation Anomalies (continued)

3.3 Twisted or warped railroad tracks

3.4 Warped Buildings

3.5 Image warping

4 Image Anomalies

Image Anomalies can be found anywhere with an image. Most of these anomalies are not caused by orthorectification, scaling, stretching, rotating or warping the image, but rather are traced to the raw images. Vehicles are considered as anomalies only when the error is perceived to be an artifact or is not discernible otherwise.

4.1 Artifacts

Image Anomalies (continued)

4.1.1 Vehicle Ghosting

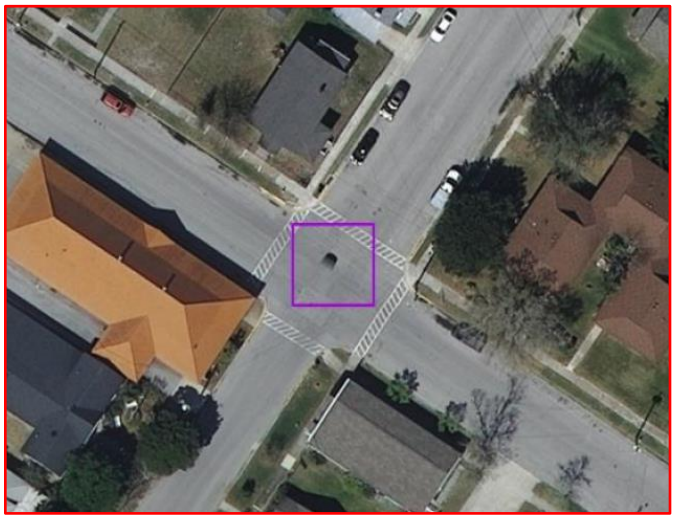


Image Anomalies (continued)

4.2 Edge Displacement

4.3 Clouds and smoke obscuring

4.4 Buildings obscuring roads

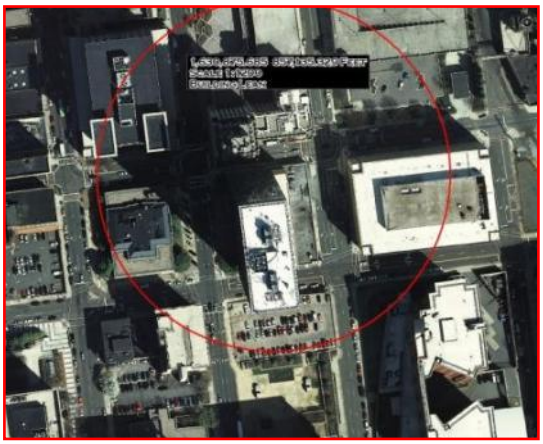


Image Anomalies (continued)

4.5 Excessive shadowing

4.6 Tree lean or shadows obstructing over 300 feet of at least a secondary road with the possibility of an alternative frame

Image Anomalies (continued)

4.7 Tile misplacement

4.8 Blurry images

4.9 Image Ghosting

Image Anomalies (continued)

4.10 Excessive dodging and tonal balancing

5 Image Anomalies Within Project Scope Requirements

The following serve to demonstrate typical issues reported that meet project requirements. Tree lean is the most widely reported issue that has the most percentage of rejected screening. Tree lean is an observation that is almost always not possible to resolve because most exposures will present the issue. Another common issue submittal is the instance of ghosted or duplicate vehicles. These instances are, in most cases, the results of seamlines placed down the middle of roads. However, especially in urban areas, the road centerline is the most practical choice for placement. Most all vehicle duplicates or ghosting issues will be rejected unless they demonstrate the perception of an indiscernible artifact. Depending on the type of sensor used to collect the imagery, there may also be instances where vehicles appear elongated or truncated based on the direction the vehicle was traveling in relation to the sensor. Issues relating to these types of instances will also be rejected.

5.1. Isolated tree lean and/or linear stretch of tree lean under 300’ or dense residential canopy

5.2. Car ghosting and duplication

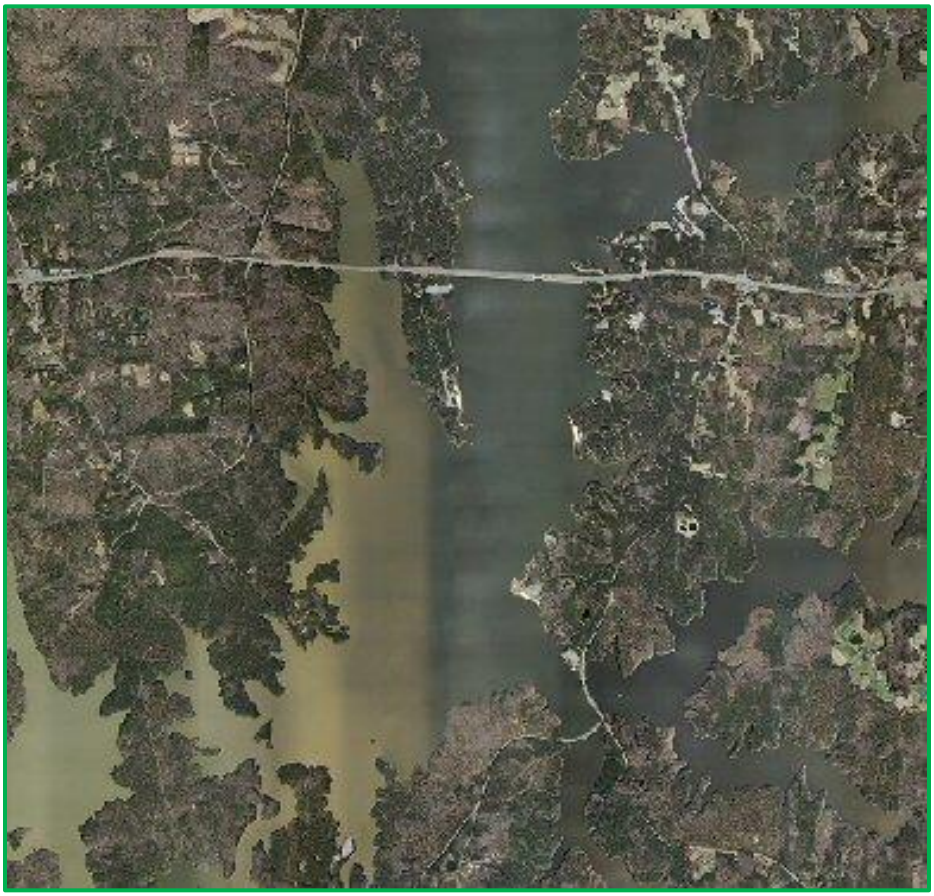
5.2.1. Vehicle stretching and truncating (Caused by type of sensor)

5.3. Building lean less than 50%

5.4. Elevated powerlines

5.5. Elevated cell towers

5.6. Hydro variations in color



5.7. Variations in tonal balance within reason